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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/572,611

03/17/2006

John Petruzzello

PHUS030335

7660

24737

7590

04/14/2009

PHILIPS INTELLECTUAL PROPERTY & STANDARDS

P.O. BOX 3001

BRIARCLIFF MANOR, NY 10510

EXAMINER

SHINGLETON, MICHAEL B

ART UNIT

PAPER NUMBER

2815

MAIL DATE

DELIVERY MODE

04/14/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/572,611	<b>Applicant(s)</b> PETRUZZELLO ET AL.	
	<b>Examiner</b> Michael B. Shingleton	<b>Art Unit</b> 2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 012909.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 9-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 9-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

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## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 9-15 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Merrill et al. US 2005/0087829 with the earliest filing date of January 31, 2003 listed (Merrill) along with Merrill et al. US 6,934,050 (Merrill '050) where Merrill '050 is not rejecting the claims indicated above but is only cited as Merrill '050 explains well known stacked structure features that are inherent in the Merrill reference that used is rejecting the above claims.

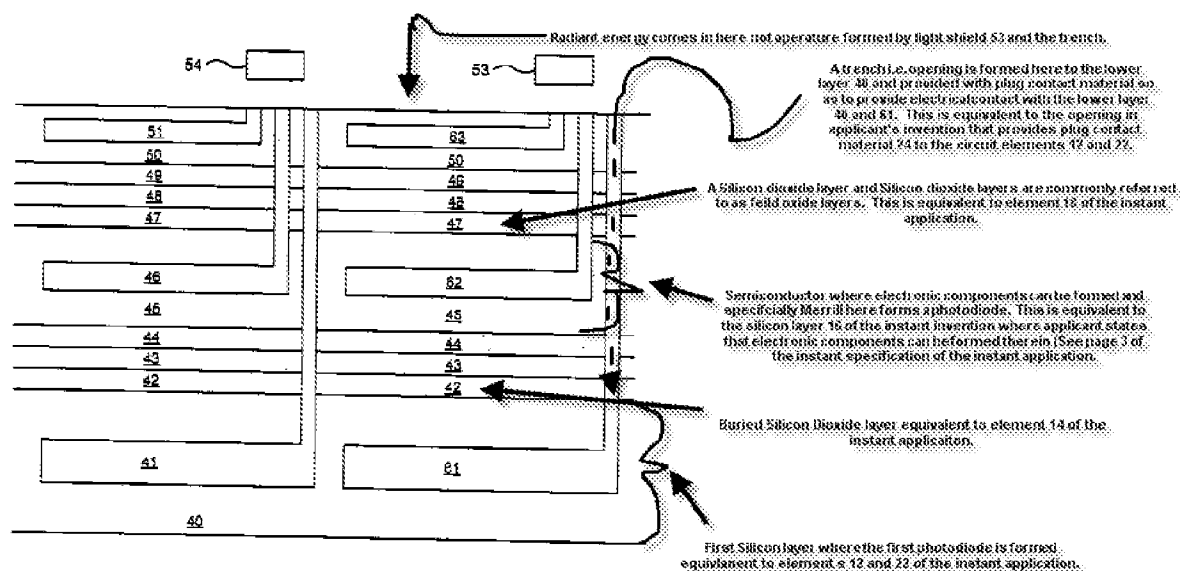


FIG. 8

Figure 8 of Merrill.

Figure 8 and the relevant text of Merrill disclose a silicon on insulator (SOI) photodiode and method of forming a SOI photodiode. The basic structure of the photodiode of the instant application is that of a common stacked multiple color photodetector. While the present applicant hints at the filtering, controlling the depth of the layer or layers, etc., this basic structure of the invention applies the well known (conventional) principles of stacked multiple color detectors. What happens in a stacked photodiode multiple color photodetector is that the higher frequency light signals (Sometimes referred to as “higher energy” light signals by some because of  $h \cdot \nu$ .) gets absorbed quicker than the lower frequency light components, so the upper detector(s) detect the higher frequency component(s) like blue and as these higher frequency components like blue are all absorbed before they reach the lower frequency light detecting components like red. (See for example see the Figure illustrated on the cover of Merrill '050 and note that Merrill '050 is as only being cited to further emphasis this well known and common principle in stacked photodiode multiple color detectors.) In the actual Merrill reference applied herewith as rejecting the disclosed structure and associated method of forming the structure, filters like 43 and 48 are also used to ensure that the higher frequency components do not reach the lower frequency detector(s). As also noted in the original disclosure of the instant invention electronic components can be formed in the layer 16 of the instant invention and it is a fact that a p-n diode that detects light energy is an electronic component (See page 3, around line 21 of the instant application.). So while the instant application does not hint at stacked photodiode photo-detectors, (The addition of such in the original

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disclosure would possibly be new matter as a broad recitation of "electronic components" in layer 16 does not necessarily mean that applicant actually invented or had actually made the invention where the electronic component in layer 16 is a photodiode. However, maybe from the stacked photodiode art applicant got the idea of forming electronic components in the silicon layer that is isolated from a lower photo diode layer by a silicon dioxide layer.), it was this passage that has clued in the examiner that the structure of the instant application exists or could possible exists in the stacked photodiode photodetector art.

The invention of Merrill discloses a silicon substrate 40 that is formed having a first portion doped "p" and the second portion 61 doped "n". This clearly forms a p-n junction and since the junction has both vertical and horizontal components, this can't help but have a "vertical pn junction". The silicon dioxide layer 42 forms a buried oxide layer and is clearly formed on the silicon substrate 40. There is a silicon layer 45 that is formed on the buried oxide layer. The functional language "wherein the amount of incident light passing through the SOI photodiode to the silicon substrate with respect to wavelength is proportional to a thickness of the silicon layer" does not add anything to the claim(s) for as stated above this is just an inherent property of the arrangement. It is the whole principle upon which stacked photodiodes work. The layer 47 that is formed on the silicon layer 45 being of silicon dioxide is a "field oxide layer". Silicon dioxide material is what is commonly referred to as a field oxide layer. The function of "wherein a thickness of the field oxide layer controls the thickness of the silicon layer" is like the functional language above that does not add anything to the claimed invention as stated above as this is just an inherent property of the arrangement. It is the whole principle upon which stacked photodiodes work. The "plug contacts" are formed in "trenches" that extend to the silicon substrate and it goes without saying that a contact is formed in the trench otherwise "plug contacts" would have a different name. Also note that Figure 15G of Merrill specifically calls the opening to the lower layers of a stacked arrangement a "trench". The examiner must read terms broadly with their plain meaning when applicant does not provide a specific definition that is different from the plain meaning of the term, i.e. a definition that defines something as something and only that something and that something is different from the plain meaning of the term. Thus if applicant wanted the term "trench" to designate some other structure than the plain meaning of the term as evidenced by even Merrill himself, then in accordance with recent case law to Halliburton Energy Services, Inc. v M-I LL, Fed. Cir., 2007-1149 Halliburton decision the court says **"We note that the patent drafter is in the best position to resolve ambiguity in the patent claims, and it is highly desirable that the patent examiners demand that applicants do so in appropriate circumstances so that the patent can be amended during prosecution rather than**

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**attempting to resolve the ambiguity in litigation.**". The structure and method of manufacturing as presented by claim 9 and 13 is seen as being clearly anticipated by that of Merrill.

With respect to claims 10 and 15 this was addressed above.

With respect to claim 11, this again presents the equation that is inherent of a silicon layer and as the layer of the prior art is silicon this layer inherently has this function. No positive limitations of distinguishing structure of the silicon layer that is different from the prior art silicon is disclosed in the claims, nor the original disclosure, i.e. nothing special is recited about the silicon layer and there is no specific limiting definition by applicant that states when the term "silicon layer" is used this defines a specific composition and lattice structure and only this specific composition and lattice structure.

With respect to claim 14, the doping of layer like 61 has to occur prior to the forming of the contact. Note that contact plug includes the metallization on the top thereof. Also note Figures 15E to 15H of Merrill here the doping of the "lower" layer 41 is provided, i.e. is formed before the trench is formed and then after the trench is formed the contact material is formed in this trench to form this "plug contact" to the lower layer. Same claimed structure and method of manufacture as disclosed and claimed is clearly disclosed by Merrill, i.e. applicant forms the lower layer 12 first and then provides an opening to the lower layer 12 and then forms a plug contact 24 to the lower layer 12 so that this lower layer is electrically contacted to the outside world.

With respect to claim 12, the contact in combination with the light shield 53 forms i.e. defines "an" aperture of the SOI photodiode. Note that there can be other apertures and the claims do not exclude other things as defining an aperture.

Note the following additional comments are made to help in the furthering of the prosecution of the instant application and help guide applicant to form an allowable amendment should applicant decide to amend the application. Applicant may try to amend the claim to state that the instant invention does not include a third silicon region similar to that of region 50 in Merrill, but applicant should take note that it has long been established in case-law that the elimination of something along with the elimination of that feature/function is generally obvious. So clearly to make a two color detector one would drop the top detector of a three detector device. That would be one way to do it that lies within routine skill in the art.

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Also elimination of a feature not needed, like for example should applicant say that the invention lacks “color filters” when the thickness of the layers ensure the color filtering function like for example in Merrill '050, is another situation where the elimination of something along with the elimination of function would have been obvious. Given that the disclosed invention and the prior art invention are so very close in structure and function it is hard for the examiner to identify something in this case which would make the claims if added to the claims allowable. The diffusions 22 at each end of the device if specifically claimed is different from the prior art cited but the examiner cannot be sure that such a feature is not out there, i.e. would have been obvious or anticipated by prior art.

Applicant's arguments filed 1-29-2009 have been fully considered but they are not persuasive.

While applicant believes that the claims are allowable over the prior art the examiner respectfully disagrees. The claims are not so limited as applicant suggests and the examiner must give the broadest reasonable interpretation to the claims as per MPEP 2111.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael B. Shingleton whose telephone number is (571) 272-1770.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Parker, can be reached on (571) 272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in cursive script, reading "Michael B. Shingleton". The signature is written in a dark, slightly textured ink.

MBS  
August 22, 2008  
April 10, 2009

/Michael B. Shingleton/  
Michael B Shingleton  
Primary Examiner  
Group Art Unit 2815